

Claims

1. A method for communicating at least one data packet between a first and a second of a plurality of communication units on a common communication channel in a distributed multiple access wireless communication system, the method comprising the steps of:

- a) providing the at least one data packet to the first communication unit for transmission by the first communication unit to the second communication unit;
- 10 b) providing at least one quality of service (QOS) parameter to the first communication unit, wherein the at least one QOS parameter is associated with the at least one data packet;
- c) the first communication unit determining at least a first transmission parameter from the at least one QOS parameter;
- 15 d) the first communication unit transmitting a transmit request message in accordance with the at least the first transmission parameter;
- e) the second communication unit transmitting a transmit grant message in response to receiving the transmit request message; and
- 20 f) in response to the first communication unit receiving the transmit grant message from the second communication unit, the first communication unit transmitting the at least one data packet.

2. A method in accordance with claim 1 wherein step (b) precedes step (a).

3. A method in accordance with claim 1 wherein step (c) further comprises the step of determining access time on expiry of which the first communication unit transmits the transmit request message.

4. A method in accordance with claim 3, wherein step (c) further comprises the step of monitoring whether access time has expired from time the at least one data packet is received.

5 5. A method in accordance with claim 3, wherein step (c) further comprises, on expiry of the access time, the step of determining whether the common communication channel is available prior to transmitting the transmit request message.

10 6. A method in accordance with claim 1 further comprising, after step (c) but before step (d), the step of determining whether the common communication channel is available.

15 7. A method in accordance with claim 1 further comprising, after step (f), the steps of:
in response to the second communication unit receiving the at least one data packet, the second communication unit transmitting an acknowledge message; and
the first communication unit receiving the acknowledge
20 message.

8. A method in accordance with claim 1 wherein step (c) further comprises the step of determining at least a second transmission parameter from the at least one quality of service parameter;

25 wherein step (d) further comprises the step of including the at least the second transmission parameter in the transmit request message, and
wherein step (e) further comprises the step of transmitting the transmit grant message in accordance with the second transmission
30 parameter.

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9. A method in accordance with claim 8 further comprising, after step (f), the step of:

in response to the second communication unit receiving the at least one data packet, the second communication unit transmitting an 5 acknowledge message; and

the first communication unit receiving the acknowledge message.

10. A method in accordance with claim 8 further comprising, after step (c) but before step (d), the step of determining whether the common 10 communication channel is available.

11. A method in accordance with claim 1, wherein step (c) comprises the step of determining when the first communication unit transmits the transmit request message.

15 12. A method in accordance with claim 1 further comprising, after step (d) but before step (e), the step of determining whether the common communication channel is available.

20 ~~13.~~ A method in a first of a plurality of communication units for transmitting at least one data packet to a second of the plurality of communication units on a common communication channel in a distributed multiple access wireless communication system, the method comprising the steps of:

25 a) providing the at least one data packet for transmission to the second of the plurality of communication units;

b) providing at least one quality of service (QOS) parameter, wherein the at least one QOS parameter is associated with the at least one data packet;

30 c) determining at least a first transmission parameter from the at least one quality of service parameter;

d) transmitting the transmit request message in accordance with the at least the first transmission parameter;

e) in response to receiving a transmit grant message from the second communication unit, the first communication unit transmitting 5 the at least one data packet.

14. A method in accordance with claim 13 further comprising, prior to step (d), the step of determining whether the common communication channel is available.

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15. A method in accordance with claim 13 wherein step (c) further comprises the step of determining the transmission time for transmitting the transmit request message.

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16. A method in accordance with claim 13 wherein step (c) further comprises the step of determining a delay time on expiry of which the transmit request message is transmitted.

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17. A method in accordance with claim 16 wherein step (d) further comprises the step of monitoring receipt of any other transmit request messages during the delay time.

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~~18.~~ A method for communicating at least one data packet in a distributed multiple access wireless communication system, the method comprising the steps of:

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a) providing at least one data packet for transmission in the distributed multiple access wireless communication system;

b) providing at least one quality of service (QOS) parameter;

c) determining a delay time and an access time from the at least one QOS parameter;

d) packetising a request to transmit message which includes the delay time;

- e) transmitting the request to transmit message after the access time has elapsed;
- f) receiving the request to transmit data packet;
- g) transmitting a clear to transmit message after the delay time

5 has elapsed;

- h) receiving the clear to transmit message;
- i) transmitting the at least one data packet;
- j) receiving the at least one data packet;
- k) transmitting an acknowledge message;

10 l) receiving the acknowledge message.

19. A method in accordance with claim 18 further comprising, after step (g) the steps of:

15 waiting until a predetermined time lapses without receiving the clear to transmit message; and

transmitting a new request to transmit message at a later time.

20. A method in accordance with claim 19, wherein the step of transmitting further comprises the steps of:

20 determining a backoff time with the at least one QOS parameter and lapsed time;

waiting until the backoff time expires;

determining a new delay time and a new access time in conjunction with the at least one QOS parameter and lapsed time;

25 packetising the new request to transmit message which includes the new delay time; and

transmitting the new request to transmit message after the new access time has elapsed.

30 21. A method in accordance with claim 19 further comprising, after step (k) the steps of:

a predetermined time lapsing without receiving the acknowledge message; and

transmitting a new request to transmit message at a later time.

5 **22.** A communication unit for communicating data packets to another communication unit on a common communication channel in a distributed multiple access wireless communication system, the communication unit comprising:

10 a) a data input for receiving at least one data packet for transmission to the another communication unit;

15 b) a quality of service (QOS) input for receiving at least one quality of service parameter, wherein the at least one QOS parameter is associated with the at least one data packet;

20 c) a wireless receiver coupled to receive incoming control and data packets on the common communication channel, and having an output for providing the control and data packets;

25 d) a decoder having an input coupled to the output of the wireless receiver for receiving the incoming control and data packets, the decoder having a first output for providing the incoming control packets, and having a second output coupled to provide the incoming data packets to a data output;

30 e) a controller coupled to the QOS input, the controller having an input coupled to the first output of the decoder for receiving incoming control packets, the controller for generating outgoing control packets in accordance with the at least one QOS parameter and the incoming control packets, and the controller having an output for providing the outgoing control packets;

35 f) an encoder having a first input coupled to the output of the controller for receiving the outgoing control packets, the encoder having a second input coupled to the data input for receiving the at least one outgoing data packet, and the encoder having an output for providing

the outgoing control packets and the at least one outgoing data packet; and

5 g) a transmitter having an input coupled to the output of the encoder for receiving the outgoing control packets and the at least one outgoing data packet, and the transmitter having an output adapted to transmit the outgoing control packets and the outgoing at least one data packet on the common communication channel.

10 23. A communication unit in accordance with claim 22 wherein the at least one QOS parameter comprises perceived QOS parameters.

15 24. A communication unit in accordance with claim 23 wherein the perceived QOS parameters include number of packets lost in prior transmissions to the another communication unit.

20 25. A communication unit in accordance with claim 23 wherein the perceived QOS parameters include ratio of number of data packets lost in prior transmissions to the another communication unit to number of data packets sent.

25 26. A communication unit in accordance with claim 22 wherein the wireless communication unit comprises a radio frequency communication unit.

27. A communication unit is accordance with claim 22 wherein the decoder comprises a control packet detector for detecting the incoming control packets.

30 28. A communication unit in accordance with claim 22 wherein the controller comprises a control packet decoder for determining transmission parameters from the incoming control packets.

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29. A communication unit in accordance with claim 22 wherein the controller comprises a control packet generator for determining which of a plurality of control packets to generate, and for determining at least one transmission parameter for inclusion in at least one of the 5 generated control packets.

30. A communication unit in accordance with claim 22, wherein the controller comprises a translator for translating the at least one QOS parameter into at least one transmission parameter.